

DAKOTA ACCESS PIPELINE PROJECT

North Dakota Tree and Shrub Inventory Report



Prepared for:

North Dakota Public Service Commission
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LIST OF ACRONYMS

ATWS	Additional Temporary Workspace
DAPL	Dakota Access Pipeline
DBH	Diameter at Breast Height
GIS	Geographic Information System
HDD	Horizontal Directional Drilling
NDFS	North Dakota Forest Service
Project	Dakota Access Pipeline Project
PSC	Public Service Commission
ROW	Right-Of-Way

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1.0 Introduction

The Dakota Access Pipeline Project (DAPL Project) is approximately 1,134 miles in length and will transport crude oil from Stanley, North Dakota, to Patoka, Illinois. The North Dakota portion of the DAPL Project is approximately 359 miles in length (which consists of approximately 147 miles of the Supply Line and approximately 212 miles of the Mainline) traversing seven counties (Mountrail, Williams, McKenzie, Dunn, Mercer, Morton, and Emmons) and includes six tank terminals with pump stations and other appurtenances.

The purpose of this inventory is to determine the number and species of trees and shrubs that would be removed in North Dakota, as well as calculate the number of trees and shrubs, by species, to be planted as compensation for those removed. Dakota Access recorded the numbers and species of trees and shrubs in windbreaks, shelterbelts and all other wooded areas affected by the Project right-of-way (ROW), additional temporary workspace (ATWS) and ancillary facility footprints.

2.0 Methods

Dakota Access, LLC has developed the DAPL North Dakota Tree and Shrub Sampling Plan (Sampling Plan) (**Appendix A**) in order to satisfy North Dakota Public Service Commission (PSC) permitting requirements for the DAPL Project. The Sampling Plan was submitted to the PSC in March, 2015 prior to the field inventory effort. The general guidance from the “Tree and Shrub Mitigation Specifications” (**Appendix B**) were followed during the preparation and implementation of the sampling plan.

Pre-Inventory

Windrows, shelterbelts, and obvious groups of trees and/or shrubs were located along the ROW using recent aerial imagery (Fall of 2014) and ArcGIS software. This step was completed in advance of the tree and shrub sampling field visit and locations were entered into a GPS unit to aid in field reconnaissance.

Field Inventory

Scientists knowledgeable in tree and shrub species identification traveled along the pipeline route and collected the inventory data. The field team visited those areas defined in the pre-inventory as well as any recently planted or other woody vegetation areas observed along the route during the field visit.

Location data was collected as a point feature using a GPS device. A unique Feature ID was assigned to each site where trees or shrubs are present. If there were multiple species present within the same wooded area, all species were recorded under the same point feature.

Several species of multi-stem shrubs were found along the DAPL route including snowberry (*Symphoricarpos occidentalis*), chokecherry (*Prunus virginiana*), and prairie rose (*Rosa arkansana*). Chokecherry is an example of a shrub with multiple stems rising from a central point while snowberry and prairie rose are rhizomatous with a single individual creating large colonies. A chokecherry with many stems rising from one central base was counted as one individual, while a colony of snowberry was counted as one individual within a specific area. The North Dakota State University Dickinson Research Extension Center states snowberry

colonies can vary in size but are typically between 60 and 170 feet in diameter¹. Field scientists designated obvious colonies of rhizomatous species as one individual. For less obvious colonies, rhizomatous shrubs of a single species within a 120 foot radius were counted as one individual.

The field sampling method varied depending on whether a particular area was planted or native growth.

In windbreaks, shelterbelts, and other planted areas:

- All trees and shrubs that are anticipated to be cleared, regardless of size, were inventoried for replacement.
- Inventories were conducted by direct stem count.

In native growth areas:

- All trees that are one inch or greater in diameter at breast height (DBH) and are anticipated to be cleared were inventoried for replacement.
- All shrubs that are anticipated to be cleared within the 50-foot-wide permanent easement, regardless of size, were inventoried for replacement.
- Inventories were conducted using either a direct stem count or using sampling plots (see below).

In general, direct stem counts were used in smaller or low density areas and a sampling plot inventory method was utilized in larger or high density areas. Where sampling plots were used, the method involved determining the overall area (in acres) of the site, then calculating the number of plots required by using the formula of one sample plot per acre for sites of 10 acres or less, and 15 sample plots for sites of greater than 10 acres (regardless of exact size). Sample plots were placed in locations that are representative of the entire area. A transect with points evenly spaced along it was utilized for extensive areas. If crews come upon a site that was not identified ahead of time, they followed this procedure to set up sample plots in the field. However, for most locations the acreage, number of sample plots required, and randomized plot locations were determined during the pre-inventory stage through ArcGIS desktop review and provided to crews prior to field surveys.

Each sample plot was set up as a circular plot with a radius of 3.72 feet (area of 0.001 acres) for shrubs, or 37.24 feet (area of 0.10 acres) for trees. The plot was circumscribed using a rope of appropriate length (3.72 or 37.24 feet) which was anchored in the center and rotated around in a circle. For each plot field crews conducted a stem count of all individual trees and shrubs that fell within or intersected the edge of the circumscribed circle. A single sampling data form was used per site, putting multiple plots on the same form. The date, crew ID, county, latitude/longitude for the overall site, site acreage, plot number, Feature IDs of associated spatial points, species names, and counts for each species was recorded on the forms. Once all plots were completed the totals were averaged across all plots for the individual site, then multiplied out to determine the stems per acre for each species. Finally, the estimated overall stem count

¹ Manske, L. L. 2005. "Western Snowberry Biology" in *2005 Annual Report Grassland Section*. North Dakota State University Dickinson Research Extension Center. Accessed online: February 10, 2015 <http://www.ag.ndsu.edu/archive/dickinso/research/2005/range05a.htm>. Modified July 14, 2009.

for the entire site was calculated by multiplying the stems per acre by the total acreage of the site.

After the inventory was complete, the numbers of trees and shrubs anticipated to be removed within the actual Project footprint (Permanent ROW, Construction ROW, ATWS and tank terminal facilities) were estimated by extrapolating tree and shrub count values specific to the actual proposed footprint acreage. Appropriate mitigation ratios (see Section 4.0) were applied to extrapolated values to determine the number of trees and shrubs of each species to be planted following construction activities.

Inventory During Construction

The total number of trees or shrubs removed may vary depending on final workspace, decision-making during construction, and site specific conditions at the time (weather, soil saturation, etc.). As such, the actual number of trees or shrubs removed in a specific location will be recorded. For example, field scientists originally labeled a group of trees for removal in the initial inventory; however, the contractor deemed it feasible to restrict the workspace due to dry conditions which avoided clearing a group of trees, changing the removal inventory. There is also the potential for the opposite situation: for example, a patch of shrubs located on a bend in the pipeline, where more work space is needed for construction.

3.0 Results

Eligible trees and shrubs were assessed between March 31 and April 29, 2015, by four field crews. The assessment included the entire 400-foot-wide survey corridor centered on the proposed 359 mile route in North Dakota. Although tree and shrub counts were collected for the entire 400-foot-wide corridor, the results of this inventory contain only the trees and shrubs within the permanent ROW, construction ROW, ATWS and Tank Terminals that are anticipated to be cleared during construction activities. Trees and shrubs inventoried outside of the ROW and ATWS are not anticipated to be impacted by the Project; however, they were included in the field data collection effort in order to accommodate revisions to tree and shrub counts in the event of route changes or workspace adjustments without necessitating additional field efforts. The actual inventory of impacted trees and shrubs will be compiled and submitted for review and approval to the North Dakota PSC along with a final plan for mitigation of the impacted trees and shrubs following construction activities.

Approximately 53.6 acres of the 400-foot-wide survey corridor were not surveyed due to access restrictions. The inventory will be updated to include trees and shrub counts within these areas prior to the compilation and submittal of the final plan for mitigation.

A total of 7,128 windbreaks/shelterbelts (planted areas) and 27,294 woodlots (native growth areas) were inventoried within the Project ROW, ATWS and tank terminal footprints. The inventory identified a total of 30,432 trees (21 unique species) and 41,364 shrubs (38 unique species) to be removed during construction of the Project (Table 3-1).

Table 3-1 Tree and Shrub Species Identified for Replacement Along the DAPL Project ROW, ATWS and Tank Terminal Facilities			
Scientific Name	Common Name	Estimated Number Removed	Estimated Number to be Planted
Trees			
<i>Acer ginnala</i>	Amur maple	14	28
<i>Acer negundo</i>	Boxelder	605	1,210
<i>Betula papyrifera</i>	Paper birch	598	1,196
<i>Celtis occidentalis</i>	Hackberry	7	14
<i>Elaeagnus angustifolia</i>	Russian-olive	636	1,272
<i>Fraxinus nigra</i>	Black ash	1	2
<i>Fraxinus pennsylvanica</i>	Green ash	5,682	11,364
<i>Juniperus scopulorum</i>	Rocky Mountain juniper	343	686
<i>Juniperus virginiana</i>	Eastern red cedar	30	60
<i>Picea glauca var. densata</i>	Black Hills white spruce	62	124
<i>Picea pungens</i>	Colorado spruce	4	8
<i>Pinus ponderosa</i>	Ponderosa pine	292	584
<i>Pinus sylvestris</i>	Scotch pine	50	100
<i>Populus deltoides</i>	Cottonwood	256	512
<i>Populus tremuloides</i>	Quaking aspen	241	482
<i>Prunus pensylvanica</i>	Pin cherry	78	156
<i>Quercus macrocarpa</i>	Bur oak	1,709	3,418
<i>Tilia cordata</i>	Littleleaf Linden	10	20
<i>Ulmus americana</i>	American elm	275	550
<i>Ulmus davidiana var. japonica</i>	Japanese elm	20	40
<i>Ulmus pumila</i>	Siberian elm	4,303	8,606
Total Trees		15,216	30,432
Shrubs			
<i>Amelanchier alnifolia</i>	Western serviceberry	118	236
<i>Artemisia cana</i>	Silver sagebrush	2,506	5,012
<i>Betula occidentalis</i>	water birch	2	4
<i>Caragana arborescens</i>	Siberian peashrub	1,927	3,854
<i>Cornus sericea</i>	Red-osier dogwood	230	460
<i>Corylus cornuta</i>	Beaked hazelnut	38	76
<i>Crataegus chrysocarpa</i>	fireberry hawthorn	477	954
<i>Crataegus rotundifolia</i>	Round-leaved hawthorn	493	986
<i>Ericameria nauseosa</i>	Rubber rabbitbrush	66	132
<i>Juniperus communis</i>	Common juniper	909	1,818
<i>Juniperus horizontalis</i>	Creeping juniper	201	402

Scientific Name	Common Name	Estimated Number Removed	Estimated Number to be Planted
<i>Krascheninnikovia lanata</i>	Winterfat	171	342
<i>Lonicera maackii</i>	Amur honeysuckle	30	60
<i>Lonicera tatarica</i>	Tatarian honeysuckle	265	530
<i>Prunus americana</i>	American plum	365	730
<i>Prunus pensylvanica</i>	Pin cherry	7	14
<i>Prunus pumila</i>	Sandcherry	50	100
<i>Prunus tomentosa</i>	Nanking cherry	52	104
<i>Prunus virginiana</i>	Chokecherry	5,847	11,694
<i>Rhamnus cathartica</i>	Common buckthorn	86	172
<i>Rhus aromatica</i>	Sumac, Fragrant	90	180
<i>Rhus trilobata</i>	Skunkbush sumac	135	270
<i>Ribes aureum</i>	Golden currant	720	1,440
<i>Ribes missouriense</i>	Missouri gooseberry	2	4
<i>Ribes odoratum</i>	Golden (Clove) currant	868	1,736
<i>Ribes oxycanthoides</i>	Canadian gooseberry	266	532
<i>Rosa arkansana</i>	Wild prairie rose (subshrub)	430	860
<i>Rosa multiflora</i>	multiflora rose	50	100
<i>Rosa woodsii</i>	Woods' rose (subshrub)	323	646
<i>Salix alba</i>	White willow	24	48
<i>Salix bebbiana</i>	Bebb willow	49	98
<i>Salix eriocephala</i>	Missouri River willow	15	30
<i>Salix interior</i>	Sandbar willow	67	134
<i>Shepherdia argentea</i>	Silver buffaloberry	2,588	5,176
<i>Symphoricarpos albus</i>	Common snowberry	6	12
<i>Symphoricarpos occidentalis</i>	Western snowberry	1,134	2,268
<i>Syringa vulgaris</i>	Common lilac	3	6
<i>Viburnum lentago</i>	Viburnum, Nannyberry	72	144
Total Shrubs		20,682	41,364
Grand Total		35,898	71,796

4.0 Discussion

Trees and shrubs identified for tree removal along the DAPL Project would require replacement planting ratios based on the type of vegetation removed (planted or native growth area) and the level of Project disturbance as defined in the Tree and shrub Mitigation Specifications and summarized below.

- In windbreaks, shelterbelts and other planted areas, trees or shrubs, regardless of size would be replaced at a 2:1 ratio.
- In native growth areas, trees anticipated to be cleared that are 1 inch DBH or greater would be replaced at a 2:1 ratio.
- In native growth areas, shrubs anticipated to be cleared in the permanent ROW (50-foot-wide) would be replaced at a 2:1 ratio (two stem cuttings for one shrub removed).
- In native growth areas outside of the permanent ROW, shrub inventory and replacement would not be required if shrubs are allowed to regenerate naturally provided:
 - shrubs are cut flush with the surface of the ground, taking care to leave the naturally occurring seed bank and root stock; or
 - if the native topsoil is preserved and replaced after construction.

Following the PSC guidelines, in native growth areas the shrubs within the Permanent ROW will be replaced. However, where possible in native growth areas outside of the Permanent ROW (Construction ROW and ATWS), shrubs will be cut flush with the ground to leave the root stock and seed bank in place allowing for natural regeneration. Where soil disturbance is necessary outside of the Permanent ROW, the soil may be preserved and replaced after construction to allow for natural regeneration of the shrubs from the roots stock and seeds retained within the topsoil.

Table 4-1 summarizes the anticipated replacement ratios for trees and shrubs removed on the Permanent ROW, Construction ROW and ATWS. These ratios will be confirmed with the PSC and detailed in the final mitigation plan prior to tree and shrub replacement.

		Permanent ROW (50')¹	Construction ROW (35' -100')²	ATWS (50' – 100')³
Planted Areas (Windbreaks, Shelterbelts or other)	Trees	2:1	2:1	2:1
	Shrubs	2:1	Natural Regeneration	Natural Regeneration
Native Growth Areas	Trees ⁴	2:1	2:1	2:1
	Shrubs	2:1	Natural Regeneration	Natural Regeneration

¹ Permanent ROW is 50' wide, generally 25' on either side of the centerline of the pipeline
² Construction ROW would range from 85' to 150' (including the Permanent ROW) depending on the presence of sensitive features and landowner concerns.
³ ATWS require to facilitate crossings of other utilities, roads, railways, waterbodies, etc. would generally extend 50' – 100' beyond the Construction ROW.
⁴ In native growth, trees that have a 1" or greater DBH would be replaces at a 2:1 ratio.

As stated previously, the total number of trees or shrubs removed may vary depending on final workspace, decision-making during construction, and site specific conditions at the time (weather, soil saturation, etc.). As such, the actual number of trees or shrubs removed in a

specific location will be recorded during clearing activities and an updated inventory will be prepared prior to Dakota Access' Tree and Shrub Mitigation Plan being filed with the PSC.

After the completion of construction activities, Dakota Access would carry out tree and shrub replacement on the DAPL route in North Dakota in accordance with PSC guidelines including the following:

- Two 2-year old saplings would be planted for every one tree designated for replacement.
- Two shrubs (stem cuttings) would be planted for every one shrub designated for replacement.
- Except in the case of invasive or noxious species, trees and shrubs would be replaced by the same species or similar species, suitable for North Dakota growing conditions as recommended by the North Dakota Forest Service (NDFS).
- Invasive or noxious species would be replaced by similar non-invasive or non-noxious species suitable for North Dakota growing conditions as recommended by the NDFS.

APPENDIX A

Dakota Access Pipeline Project North Dakota Tree and Shrub Sampling Plan

DAKOTA ACCESS PIPELINE PROJECT

NORTH DAKOTA Tree and Shrub Sampling Plan



DAKOTA ACCESS, LLC
An ENERGY TRANSFER Company

Prepared for:

North Dakota Public Service Commission

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Bismarck, ND 58505

March 2015

1.0 INTRODUCTION

Dakota Access, LLC has developed and intends to implement this tree and shrub sampling plan to satisfy North Dakota Public Service Commission (NDPSC) permitting requirements for the Dakota Access Pipeline Project (DAPL Project). The general guidance from the “Tree and Shrub Mitigation Specifications” are being applied in this plan. The Specifications state that:

- In windbreaks, shelterbelts and other planted areas, trees and shrubs anticipated to be cleared, regardless of size, must be inventoried for replacement.
- In native growth areas, trees anticipated to be cleared that are 1 inch diameter at breast height (dbh) or greater must be inventoried for replacement.
- In native growth areas, trees and shrubs may be inventoried by actual count or by a sampling method that will properly represent the woody vegetation population. A sampling plan developed by the company, filed with the North Dakota Public Service Commission (Commission) and approved prior to the start of construction must define the sampling method to be used for trees, for tall shrubs and for low shrubs. The data from the sample plots must be extrapolated to the total acreage of the wooded area to be cleared to determine the species and quantity of trees and shrubs to be replaced.

The follow sections outline the DAPL Project’s proposed methodology to assess all eligible trees and shrubs on the approximate 359 miles of pipeline in North Dakota. DAPL will conduct this assessment on their 400ft environmental survey corridor centered on the proposed pipeline. Since, the construction workspace has not been finalized, following construction activities, the actual inventory of impacted trees and shrubs will be compiled and submitted for review and approval to the NDPSC along with plans for mitigation of these species.

2.0 Sampling Methodology

Pre-Inventory

Windrows, shelterbelts, and obvious groups of trees and/or shrubs will be located along the ROW using recent aerial imagery (2014) and ArcGIS software. This step will be completed in advance of the tree and shrub sampling field visit and locations will be entered into a GPS unit to aid in field reconnaissance.

Field Inventory

Scientists knowledgeable in tree and shrub species identification will travel along the pipeline route and collect the inventory data. The field team will visit those areas defined in the pre-inventory as well as any recently planted or other woody vegetation areas observed along the route during the field visit. All data will be collected using a tablet and a Tree and Shrub Inventory Form (Appendix B). Data collected during the inventory will include:

- Date of inventory
- Field scientist(s) conducting inventory
- General location (milepost)
- Species name
- Number of individual trees or shrubs
- Whether the trees or shrubs were planted or volunteer
- Designation to avoid mature native trees during construction
- Designation to remove non-native or invasive trees or shrubs during construction and replace them with more desirable species
- Number of trees removed during construction activities
- General notes and landowner specifications for replacement

Location data will also be collected with GPS and linked to tabular data using an identification code based on the milepost and six-digit species code. For example, chokecherry (*Prunus virginiana*) near milepost 3.25 would be recorded in the GPS as “3.25-PRUVIR”. When the field data are analyzed in ArcGIS, the location of the shrub or tree on the pipeline route and its associated land-cover will be defined. Location data for large colonies/clusters will be recorded as a polygon and isolated tree/shrub data will be recorded as a single point.

Several species of multi-stem shrubs are anticipated to be found along the DAPL route including snowberry (*Symphoricarpos occidentalis*), chokecherry (*Prunus virginiana*), and prairie rose (*Rosa arkansana*). Chokecherry is an example of a shrub with multiple stems rising from a central point while snowberry and prairie rose are rhizomatous with a single individual creating large colonies. A chokecherry with many stems rising from one central base would be counted as one individual, while a colony of snowberry will be counted as one individual within a specific area. The North Dakota State University Dickenson Research Extension Center states snowberry colonies can vary in size but are typically between 60 and 170 feet in diameter (Manske, 2005). Field scientists will designate obvious colonies of rhizomatous species as one individual. For less obvious colonies, rhizomatous shrubs of a single species within a 120 foot radius will be counted as one individual.

Inventory During Construction

The total number of trees or shrubs removed may vary depending on final workspace, decision-making during construction, and site specific conditions at the time (weather, soil saturation, etc.). As such, the actual number of trees or shrubs removed in a specific location will be recorded. For example, field scientists originally labeled a group of trees for removal in the initial inventory; however, the contractor deemed it feasible to restrict the workspace due to dry conditions which avoided clearing a group of trees, changing the removal inventory. There is also the potential for the opposite situation: for example, a patch of shrubs located on a bend in the pipeline, where more work space is needed for construction.

Manske, L. L. 2005. “Western Snowberry Biology” in *2005 Annual Report Grassland Section*. North Dakota State University Dickenson Research Extension Center. Accessed online: February 10, 2015 <http://www.ag.ndsu.edu/archive/dickinso/research/2005/range05a.htm>. Modified July 14, 2009.

**3.0 Appendix A:
State of North Dakota Public Service Commission
Tree and Shrub Mitigation Specifications**

**STATE OF NORTH DAKOTA
PUBLIC SERVICE COMMISSION**

Tree and Shrub Mitigation Specifications

Inventory

1. Trees and shrubs anticipated to be cleared, including those that are considered invasive species or noxious weeds (e.g., *Caragana arborescens*, *Elaeagnus angustifolia*, *Rhamnus cathartica*, *Tamarix chinensis*, *T. parviflora*, *T. ramosissima*, *Ulmus pumila*), must be inventoried before cutting. The inventory must record the location, number, and species of trees and shrubs.
2. In windbreaks, shelterbelts and other planted areas, trees or shrubs anticipated to be cleared, regardless of size, must be inventoried for replacement.
3. In native growth areas, trees anticipated to be cleared that are 1 inch diameter at breast height (dbh) or greater must be inventoried for replacement.
4. In native growth areas, shrubs anticipated to be cleared in the permanent right-of-way must be inventoried for replacement.
5. In native growth areas outside the permanent right-of-way, shrubs must be cut flush with the surface of the ground, taking care to leave the naturally occurring seed bank and root stock intact. If soil disturbance is necessary, the native topsoil must be preserved and replaced after construction. Shrubs must be allowed to regenerate naturally where native topsoil is preserved and replaced. Where native topsoil is not preserved and replaced, shrubs anticipated to be cleared must be inventoried for replacement.

6. In native growth areas, trees and shrubs may be inventoried by actual count or by a sampling method that will properly represent the woody vegetation population. A sampling plan developed by the company, filed with the North Dakota Public Service Commission (Commission) and approved prior to the start of construction must define the sampling method to be used for trees, for tall shrubs and for low shrubs. The data from the sample plots must be extrapolated to the total acreage of the wooded area to be cleared to determine the species and quantity of trees and shrubs to be replaced.

Clearing for Construction

7. Trees and shrubs must be selectively cleared, leaving mature trees and shrubs intact where practical.
8. The maximum width of clear cuts through windbreaks, shelterbelts and all other wooded areas is 50 feet, unless otherwise approved by the Commission.
9. If the area of trees or shrubs actually cleared differs from the area inventoried, the difference in number of trees and shrubs to be replaced must be noted on the inventory.

Replacement

10. Prior to tree and shrub replacement, documentation identifying the number and variety of trees and shrubs removed, as well as the mitigation plan for the proposed number, variety, type, location and date of replacement plantings, must be filed with the Commission for approval.
11. Two 2-year-old saplings must be planted for every one tree removed. Two shrubs (stem cuttings) must be planted for every one shrub removed.
12. Except in the case of invasive or noxious species, trees and shrubs must be replaced by the same species or similar species, suitable for North Dakota growing conditions as recommended by the North Dakota Forest Service.

Invasive or noxious species must be replaced by similar non-invasive or non-noxious species suitable for North Dakota growing conditions as recommended by the North Dakota Forest Service.

13. Tree and shrub replacement must not be conducted within a 20 to 30 foot wide path over the pipeline to facilitate visual inspections of the right-of-way in accordance with U.S. Department of Transportation safety regulations.
14. Landowners must be given the option of having replacement trees and shrubs planted on the landowner's property, either on or off the right-of-way. The landowner must also be given the opportunity to waive those options in writing in order to have replacement trees and shrubs planted off the landowner's property.
15. At the conclusion of the project, documentation identifying the actual number, variety, type, location and date of the replacement plantings must be filed with the Commission.
16. Tree and shrub replacements must be inspected annually, in September, for three years. The first annual inspection must be at least one year from the anniversary date of the original plantings. A report of each annual inspection must be submitted to the Commission by October 1 of each year, documenting the condition of plantings and any woodlands work completed as of September of each year. If after the third annual report the survival rate is less than 75%, the Commission may order additional planting(s).

**4.0 Appendix B:
Dakota Access Pipeline Tree and Shrub Inventory Form**

APPENDIX B

State of North Dakota Public Service Commission Tree and Shrub Mitigation Specifications

**STATE OF NORTH DAKOTA
PUBLIC SERVICE COMMISSION**

Tree and Shrub Mitigation Specifications

Inventory

1. Trees and shrubs anticipated to be cleared, including those that are considered invasive species or noxious weeds (e.g., *Caragana arborescens*, *Elaeagnus angustifolia*, *Rhamnus cathartica*, *Tamarix chinensis*, *T. parviflora*, *T. ramosissima*, *Ulmus pumila*), must be inventoried before cutting. The inventory must record the location, number, and species of trees and shrubs.
2. In windbreaks, shelterbelts and other planted areas, trees or shrubs anticipated to be cleared, regardless of size, must be inventoried for replacement.
3. In native growth areas, trees anticipated to be cleared that are 1 inch diameter at breast height (dbh) or greater must be inventoried for replacement.
4. In native growth areas, shrubs anticipated to be cleared in the permanent right-of-way must be inventoried for replacement.
5. In native growth areas outside the permanent right-of-way, shrubs must be cut flush with the surface of the ground, taking care to leave the naturally occurring seed bank and root stock intact. If soil disturbance is necessary, the native topsoil must be preserved and replaced after construction. Shrubs must be allowed to regenerate naturally where native topsoil is preserved and replaced. Where native topsoil is not preserved and replaced, shrubs anticipated to be cleared must be inventoried for replacement.

6. In native growth areas, trees and shrubs may be inventoried by actual count or by a sampling method that will properly represent the woody vegetation population. A sampling plan developed by the company, filed with the North Dakota Public Service Commission (Commission) and approved prior to the start of construction must define the sampling method to be used for trees, for tall shrubs and for low shrubs. The data from the sample plots must be extrapolated to the total acreage of the wooded area to be cleared to determine the species and quantity of trees and shrubs to be replaced.

Clearing for Construction

7. Trees and shrubs must be selectively cleared, leaving mature trees and shrubs intact where practical.
8. The maximum width of clear cuts through windbreaks, shelterbelts and all other wooded areas is 50 feet, unless otherwise approved by the Commission.
9. If the area of trees or shrubs actually cleared differs from the area inventoried, the difference in number of trees and shrubs to be replaced must be noted on the inventory.

Replacement

10. Prior to tree and shrub replacement, documentation identifying the number and variety of trees and shrubs removed, as well as the mitigation plan for the proposed number, variety, type, location and date of replacement plantings, must be filed with the Commission for approval.
11. Two 2-year-old saplings must be planted for every one tree removed. Two shrubs (stem cuttings) must be planted for every one shrub removed.
12. Except in the case of invasive or noxious species, trees and shrubs must be replaced by the same species or similar species, suitable for North Dakota growing conditions as recommended by the North Dakota Forest Service.

Invasive or noxious species must be replaced by similar non-invasive or non-noxious species suitable for North Dakota growing conditions as recommended by the North Dakota Forest Service.

13. Tree and shrub replacement must not be conducted within a 20 to 30 foot wide path over the pipeline to facilitate visual inspections of the right-of-way in accordance with U.S. Department of Transportation safety regulations.
14. Landowners must be given the option of having replacement trees and shrubs planted on the landowner's property, either on or off the right-of-way. The landowner must also be given the opportunity to waive those options in writing in order to have replacement trees and shrubs planted off the landowner's property.
15. At the conclusion of the project, documentation identifying the actual number, variety, type, location and date of the replacement plantings must be filed with the Commission.
16. Tree and shrub replacements must be inspected annually, in September, for three years. The first annual inspection must be at least one year from the anniversary date of the original plantings. A report of each annual inspection must be submitted to the Commission by October 1 of each year, documenting the condition of plantings and any woodlands work completed as of September of each year. If after the third annual report the survival rate is less than 75%, the Commission may order additional planting(s).